Abstract to AGU

Mapping the extent of inundation of the Amazon River with the JERS 1 Synthetic Aperture Radar (SAR).

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Every year for several months, large areas of forest surrounding the Amazon river in South America are flooded, the depth of the flooding in some cases exceeding ten meters. These seasonal flooded conditions result in distinct habitats for various plant and animal species, some of them rare and endangered. Flooded forests and grasses are also often the breeding ground for mosquitoes and other insects that impact human populations in the region. In addition, it is thought that methane emissions from the flooded grasses and forests of South America contribute significantly to the Earth's global carbon budget.

While the impact of the flooding is profound, the extent of flooding is not well known due to the difficulty in monitoring large expanses of flooded forest from the ground. Moreover, extensive cloud cover and the limited ability of optical sensors to detect flooding beneath a forest canopy make traditional remote sensing techniques of limited usefulness. Recently, however, a joint project between the Japanese National Space Development Agency (NASDA) and NASA's Jet Propulsion Laboratory (JPL) was begun to map with synthetic aperture radar (SAR) the extent of inundation that occurred along the entire length of the Amazon river during one seasonal flooding cycle. Data acquisitions by the JERS 1 SAR occurred during an extreme low water of the Amazon river (September-November 1995) and during the subsequent high flood period (May-June 1996).

Since the microwave radiation from the JERS 1 SAR is only minimally effected by clouds and rain, this mapping of the Amazon river basin constitutes the first time that the entire Amazon river has been mapped at high resolution (20 meters) during a single season, by any season.

The JERS 1 SAR imagery of flooded forests is quite distinct from those of non-flooded forests. Therefore, classification of the data will easily allow accurate measurements of the areal coverage of flooded forests, open water, and non-flooded forests for both periods of data coverage.